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<p>(21) International Application Number: PCT/IT90/00024 (22) International Filing Date: 7 March 1990 (07.03.90) (30) Priority data: 19362 A/90 14 February 1990 (14.02.90) IT (71)(72) Applicant and Inventor: SEGRETO, Diego [IT/IT]; Via Popilia, 252-H, I-87100 Cosenza (IT). (74) Agent: DIGIOVANNI, Italo; Ufficio Brevetti Dott. Ing. Digiovanni Schmiedt, Via Aldrovandi, 5, I-20129 Milano (IT). (81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent)*, DK (European patent), ES (European patent), FR (European patent), GB (European patent), IT (European patent), LU (European patent), NL (European patent), SE (European patent).</p>		<p>Published <i>With international search report.</i></p>
<p>(54) Title: DEVICE FOR REMOVING WAX FROM THE EXTERNAL AUDITORY MEATUS</p> <p>(57) Abstract</p> <p>Device (10) for removal of wax from the auditory meatus comprising a tapered tubular body (11) of combustible material, open at its two ends, gradual transfer of wax into the lower chamber of said body being obtained by inserting the tip (14) in the entry (21) to the auditory meatus and igniting the upper end, said transfer taking place due to the phenomenon of suction created by heating of the internal air during gradual combustion of said body as far as a certain safety distance from the auricle (22) of the ear.</p>		

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DEVICE FOR REMOVING WAX FROM THE EXTERNAL AUDITORY MEATUS

The device concerns a means for facilitating removal of wax from the external auditory meatus.

Under normal conditions wax does not accumulate in the meatus but on the contrary is continually moved outwards by natural vibrations of the skin.

It often happens, however, especially in people who have an excess amount of hair in their ears, or who suffer from inflammations of the skin, or remain for a long time in dusty environments, that wax accumulates forming a kind of plug. Such accumulation may be the cause of various annoyances, buzzing noises, pain and even temporary deafness.

Entry of water, during a bath or under a shower, may cause temporary swelling of the wax plug.

In these cases cleaning the ears is no longer sufficient and more adequate action has to be taken.

The frequently used pads of cotton wool fixed onto match sticks, hairpins or the like may lacerate the skin and favour entry of germs into the cavity. The cotton pad may even push the wax further in and block the auditory meatus completely.

For those with very thin tympanic membranes or who have had ear surgery, the membrane can even be perforated during the cleaning process.

This makes necessary the use of pincers or washing out with a syringe.

Clearly, to avoid serious damage to the ears, such equipment can only be used by qualified people which means a visit to the ear nose and throat specialist.

In the most difficult cases the specialist uses, in hospital, a suction apparatus.

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The above shows that removal of ear wax is always a complex and delicate operation and can only be done by a specialist.

The present invention eliminates or lessens the disadvantages referred to as will be explained below.

Subject of the invention is a device for removing wax from the external auditory meatus, and comprises an oblong chamber at one end of which is a tubular tip suitable for insertion, with a substantially close fit, into the opening
10 of the auditory meatus.

The other end of said chamber is kept in communication with the atmosphere.

By suitably heating the internal air a suction effect is created from the tip up to the other extremity and thus
15 transfer of the ear wax from the auditory meatus to the lower end of said chamber.

The chamber is preferably formed of a tapered tubular body having a lesser diameter that allows insertion of the tip into the auditory meatus.

20 The body of the chamber is combustible and its internal air can therefore be heated by simply igniting the edge of the body at its extremity in contact with the atmosphere and allowing it to burn down to a safe distance from the auricle.

The tapered tubular body is preferably made of cotton fabric treated with combustible material and coated with a
25 layer of stearic wax to which perfumed substances may be added if desired, and is intended to be thrown away after use. In one type of execution the tapered body is made by a spirally wound cotton tape coated with stearic wax.

30 In one type of execution the tubular body is fitted with a handle of non-combustible material placed near the tip and

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surrounding the tubular body projecting outward from it for a width sufficient to function as a fire-break.

In one type of execution that part of the chamber that is in contact with the auditory meatus consists of a non-combustible end piece the height of which prevents the burning part from exceeding a safe distance from the auricle.

Advantageously this non-combustible part is fitted with a handle.

In a preferred type of execution comparative dimensions of the device are approximately as follows:

- greatest diameter of the tapered chamber equivalent to three times the maximum diameter of the tip;
- height 10-15 times the greatest diameter of the chamber;
- length to be used for burning about 2/3 of total height.

The sizes of the various parts, the type of material used for the basic structure and combustible substance are advantageously such as to allow gradual burning to continue for about five minutes.

With this device ear wax can be removed with the greatest ease without having to visit a specialist.

The operation can be done at home by any helper avoiding the need for any mechanical or manual manipulation.

All risks of harming any part of the ear are avoided.

Within the short space of about 5 minutes, even the hardest wax can be entirely removed.

Cost of the device being practically negligible the operation can be repeated without problems in any family.

Characteristics and purposes of the device will be made even clearer by the following examples of its execution illustrated by diagrammatic figures.

Examples of execution

Fig.1 The device, subject of the invention, the body of which is made of a spiralled tape, side view partially cut away.

5 Fig.2 The device in use.

Fig.3 The device, subject of the invention, with tapered body and handle, side view, partially cut away.

Fig.4 The device, subject of the invention, with pointed end provided with a handle, side view, partially cut away.

Fig.5 Plan view of the device in Fig. 4.

Fig.6 The device in Fig. 4 when in use.

In the device 10 there is a tubular tapered body 11 made from a tape 12 of cotton fabric, spiral wound, coated with an outer layer 13 of stearic wax.

The external diameter of the tip 14 is such as to allow it to penetrate for 1 - 2 mm inside the auditory meatus.

The diameter at the other end 15 of said tapered body is practically three times greater than that at the tip.

20 Obviously, however, these dimensions can vary appreciably according to the type of execution, to industrial and commercial needs and to specific preferences.

Figure 2 illustrates the best way of using the device

The head 20 of the patient is laid horizontally with the ear 22 facing upwards.

Having first cleared away hair and any extraneous material from around the auricle, the operator inserts the tip 14 of the device into the entry to the auditory meatus for 1 to 2 mm.

30 The upper edge 15 of the tapered body is then ignited. The flame 23 burns slowly down towards the tip without exceeding roughly 2/3 of the entire tapered body.

Combustion continues for about five minutes at the end of which the unburnt end of the tapered body will have become filled with wax spontaneously transferred into it from the auditory meatus.

- 5 The used end is then thrown away and the patient will instantly feel relief.

Transfer of wax from the auditory meatus to the tapered body comes about as a consequence of heating the air inside the chamber 16.

- 10 In that chamber the convective movement is created from below upwards producing sufficient suction to draw the wax up into said chamber.

Bearing in mind the material used, cotton and stearic wax, combustion takes place without creation of an appreciable
15 quantity of residual material and without volatile substances. Figure 3 illustrates another version 30 characterized by a tapered body 31 of cotton fabric 32 coated on the outside by a layer 33 of stearic wax.

- At about 2/3 from the summit 34 a handle 35 of non-combustible
20 material is mounted comprising a strengthening rib 36.

Said handle 35 makes it easier to hold the tapered body and also stops the burning process to keep it at a safe distance from the auricle.

- Figs. 4 and 5 illustrate another variant 40 comprising a
25 tapered body 41 with tip 42 and summit 43, of cotton fabric 44 coated with a layer 45 of wax.

The tip 42 is inserted into the larger hole 46 of the tapered end piece 47.

- The tip 48 of said end piece is of a size suitable for penetration
30 into the auditory meatus.

The end piece is provided with a handle 49 with under rib 55.

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Fig. 6 shows the device illustrated in Figs. 4 and 5, in use with the tip 48 of the end piece 47 inserted into the entry 50 to the auditory meatus of the ear 51 of the patient 52.

5 The flame 53 generated by combustion of the body 41 produces the phenomenon of suction already described, gradually drawing up the wax 54 from the auditory meatus into said end piece. Being made of non-combustible and transparent material, this latter ensures maintenance of an adequate
10 quate distance between the flame and the ear and likewise a view of the wax while it is being moved.

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CLAIMS

1. Device (10) (30) (40) for removing wax (54) from the auditory meatus,
characterized in that it comprises an oblong chamber (16)
5 for drawing the wax up, open at its two ends, having at one end a tubular tip (14) (48) suitable for substantially air-tight insertion inside the entry (21) (50) to the auditory meatus, the other end (15) (34) (43) of said chamber (16) being in communication with the air and comprising a means
10 for heating the internal air to create a suction effect from the tip (14) (48) to the other end (15) (34) (43) and thus transfer of the wax from the auditory meatus into the lower end of said chamber (16).
2. Device as in claim 1,
15 characterized in that the chamber (16) consists of a combustible body (11) (31) (41) so that its internal air can be heated by igniting the edge of its end (15) (34) (43) in communication with the atmosphere and by gradual combustion of said body (11) (31) (41) to within a certain safety dis-
20 tance from the auricle (22) (51) of the ear.
3. Device as in claim 2,
characterized in that the combustible body (11) (31) (41) is provided with a handle (35) (49) of non-combustible material placed near to the tip (14) (48) and surrounding
25 said body (11) (31) (41) with a width sufficient for it to function as a fire break, said handle (35) (49) being made of non-combustible material.
4. Device as in claim 1,
characterized in that the chamber (16) is formed of a tubu-
30 lar body (11) (31) (41) of cotton fabric (12) (32) (44) treated with combustible materials (13) (33) (45).

5. Device as in claim 1,
characterized in that the chamber (16) is formed of a tubular body (11) (31) (41) of cotton fabric coated with a layer (13) (33) (45) of stearic wax.
- 5 6. Device as in claim 1,
characterized in that the chamber (16) is formed of a tapered tubular body (11) (31) (41), to be used only once, having a tip (14) (48) the diameter of which is less than that of the entry (21) (50) to the auditory meatus.
- 10 7. Device as in claim 6,
characterized in that the tapered body (11) (31) (41) is made from a helically wound cotton tape (12).
8. Device as in claim 6,
characterized in that the tip (48) of the chamber destined
15 to come in contact with the auditory meatus consists of an end piece (47) of non combustible material the length of which is such as to prevent the flame from exceeding the safety distance from the auricle of the ear (22) (51).
9. Device as in claim 6,
20 characterized, in a preferred type of execution, by the following approximate proportions:
- greatest diameter of the tapered chamber (16) equivalent to three times the maximum diameter of the tip (14) (48);
 - height equivalent to 10-15 times the maximum diameter of
25 the chamber (16);
 - length for combustion equal to about 2/3 of total height.
10. Device as in claim 2,
characterized in that dimensions of the various parts, the type of material used to make the chamber (16) and for the combustible
30 substance are such as to permit gradual combustion lasting about five minutes.

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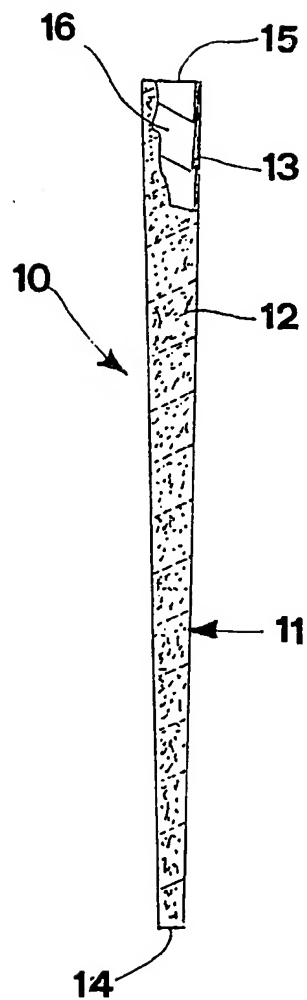


fig. 1

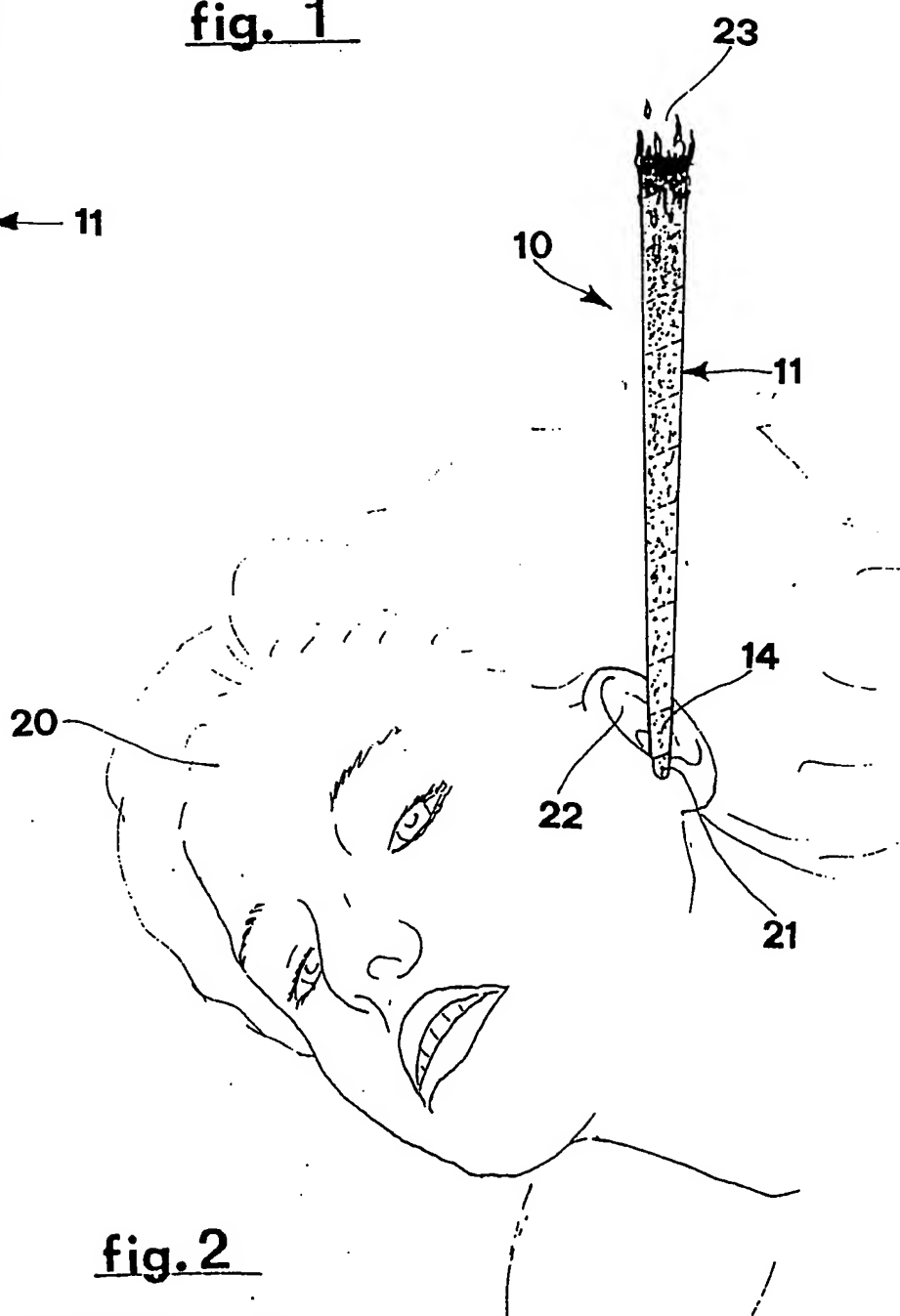


fig.2

fig. 3

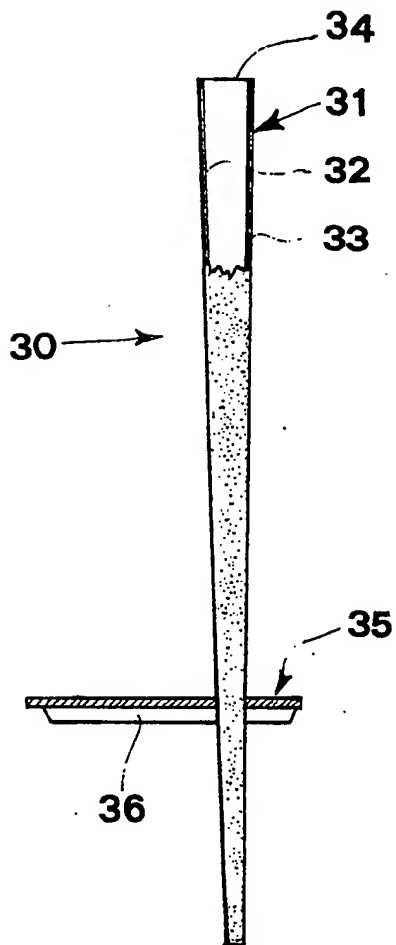


fig. 4

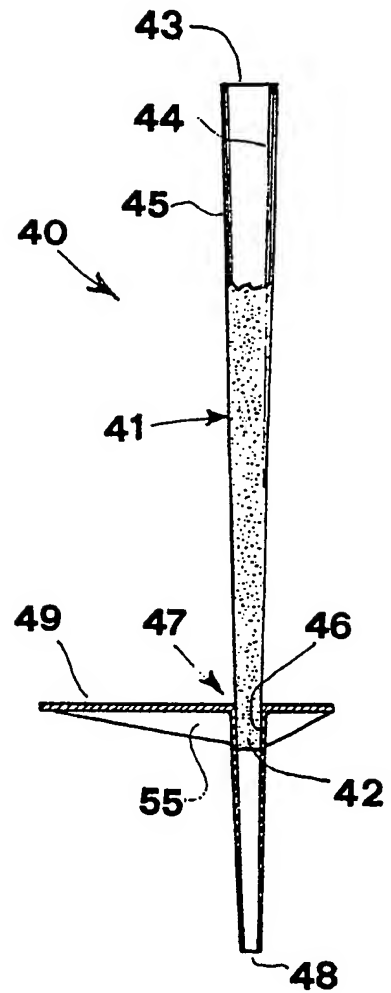
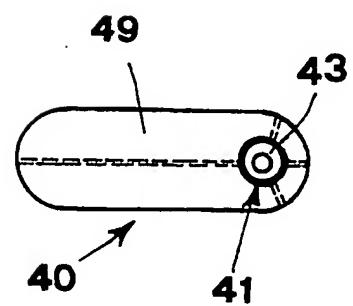


fig. 5



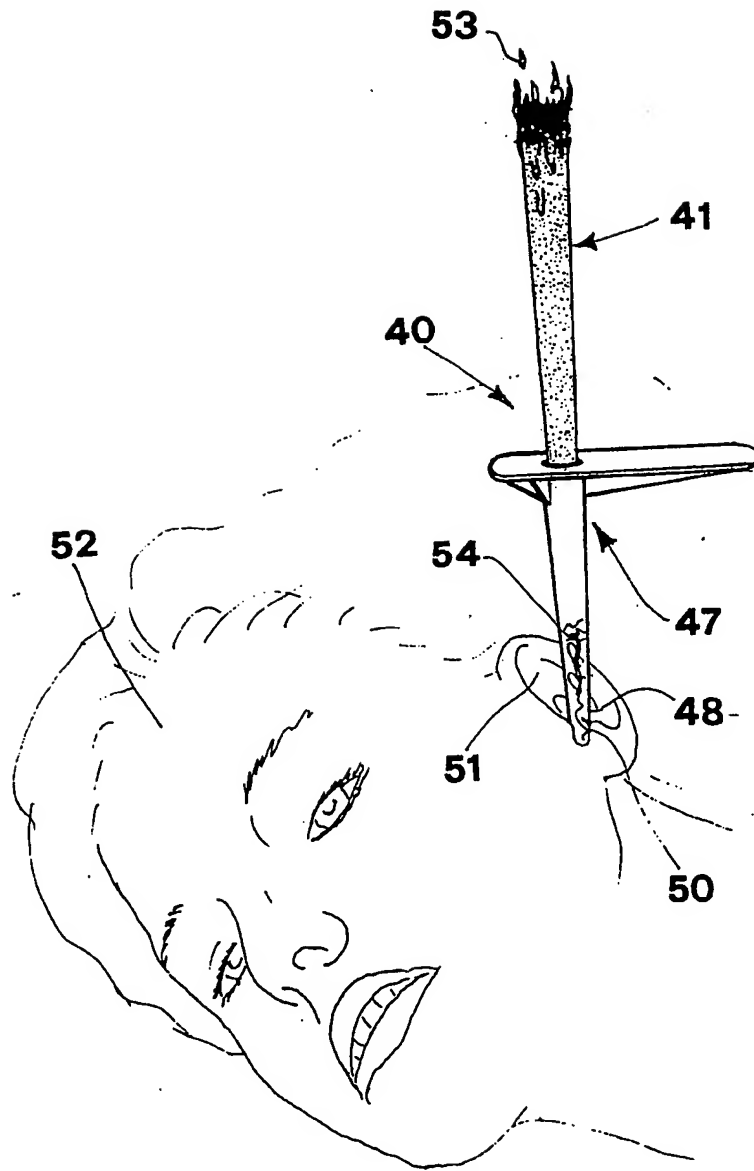


fig. 6

INTERNATIONAL SEARCH REPORT

International Application No PCT/IT 90/00024

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC IPC5: A 61 F 11/00		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
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IPC5	A 61 F	
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III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	EP, A1, 0234061 (VANDENBERGH, WALTER) 2 September 1987, see the whole document --	1
A	EP, A1, 0243261 (SANOFI) 28 October 1987, see the whole document -- -----	1
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IV. CERTIFICATION		
Date of the Actual Completion of the International Search		Date of Mailing of this International Search Report
13th December 1990		08.01.91
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**ANNEX TO THE INTERNATIONAL SEARCH REPORT
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A1- 0234061	02/09/87	BE-A- 904040	02/05/86
EP-A1- 0243261	28/10/87	EP-A- 0266383	11/05/88
		FR-A- 2597331	23/10/87
		WO-A- 87/06456	05/11/87

For more details about this annex : see Official Journal of the European patent Office, No. 12/82